MYCOTAXON

ISSN (print) 0093-4666 (online) 2154-8889 Mycotaxon, Ltd. ©2022

July–September 2022—Volume 137, pp. 471–475

https://doi.org/10.5248/137.471

Didymium dictyosporum sp. nov. from Mexico

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Abstract — A new myxomycete species, *Didymium dictyosporum* from Mexico, is described and illustrated. It is characterized by its sessile to shortly stipitate whitish to greyish fruiting bodies, absence of a capillitium, and reticulate spores. The new species is compared with other morphologically similar myxomycetes. Micrographs of the most important characteristics under LM and SEM are provided.

Key words — *Amoebozoa*, *Myxogastrea*, *Physarales*, slime molds, taxonomy

Introduction

During the last six years, our survey of moist chamber cultures prepared with substrates from different tree species collected in the urban Mexico City area has revealed some new myxomycete species to document the biodiversity of Mexico, including *Perichaena polygonospora* Novozh. & al. (Lizárraga & al. 2016) and *Licea tuberculata* G.W. Martin (Lizárraga & Moreno 2020). We recently obtained fruiting bodies of a *Didymium* species on bark samples from *Populus deltoides* in a moist chamber culture that presented sufficient macroscopic and microscopic differences to be described as a species new to science.

Didymium is represented by 99 species worldwide (Lado, 2022), of which 36 species have been recorded for Mexico (Lado & Wrigley de Basanta 2008, Salazar-Márquez & al. 2013, Lizarraga & al. 2016, Moreno & al. 2017).

Didymium is characterized by its sessile, stipitate, or plasmodiocarpic fruiting bodies superficially covered with crystalline lime, a stipe (when present) that may or may not be calcareous, spores that are black in mass and violaceous to purplish brown as seen through the LM, and a capillitium (when present) comprising threads that are usually abundant but which can be sparse or even absent in some species. Most generic characters are shared with *Mucilago,* which is included in the same family (*Didymiaceae* Rostaf. ex Cooke). The only morphological character separating the two genera is the aethaloid fruiting body in *Mucilago*. Leontyev & al. (2019), however, place the two genera in phylogenetically separate clades.

Materials & methods

Small pieces of bark obtained from living trees were placed in moist chamber cultures following the technique of Stephenson & Stempen (1994). For the microscopic study, specimens were mounted in Hoyer's medium. The SEM study was done with a Zeiss DSM-950 microscope. Ultramicroscopic studies were carried out following the technique described in Lizárraga & al. (2016). The material of the new species was deposited in the Herbarium of the Universidad de Alcalá, Madrid, Spain (AH) and in the Herbarium of Universidad Autónoma de Ciudad Juárez, Chihuahua, Mexico (UACJ).

Taxonomy

Didymium dictyosporum Lizárraga & G. Moreno, **sp. nov.** Fig. 1

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Differs from *Didymium atrichum* by its spore reticulum with fewer meshes per hemisphere and higher walls.

Type: Mexico, Mexico City, Parque Tezozomoc, on bark of *Populus deltoides* W. Bartram ex Marshall, placed into moist chamber culture 10–V–2021, obtained 20–VII–2021, leg. M. Lizárraga & H.R. Pelayo (**Holotype**, AH 51461).

Etymology: in reference to the reticulate spores.

Sporocarps clustered to scattered, sessile to shortly stipitate, 0.15–0.2 mm total height. Sporotheca 0.05–0.2 mm diam., whitish to greyish, globose, subglobose to pulvinate. Stipe short, 0.01–0.03 mm long, straw-yellow. Hypothallus inconspicuous. Peridium double, inner layer hyaline, membranous, external layer cartilaginous, smooth, eggshell-like, firm, formed by stellate crystals of calcium carbonate, with irregular dehiscence. Pseudocolumella not observed. Capillitium not observed. Spores black in mass, light violaceous under LM, (9–)10–12(–13) µm diam., globose to subglobose, reticulate to subreticulate. Under SEM, the spore ornamentation

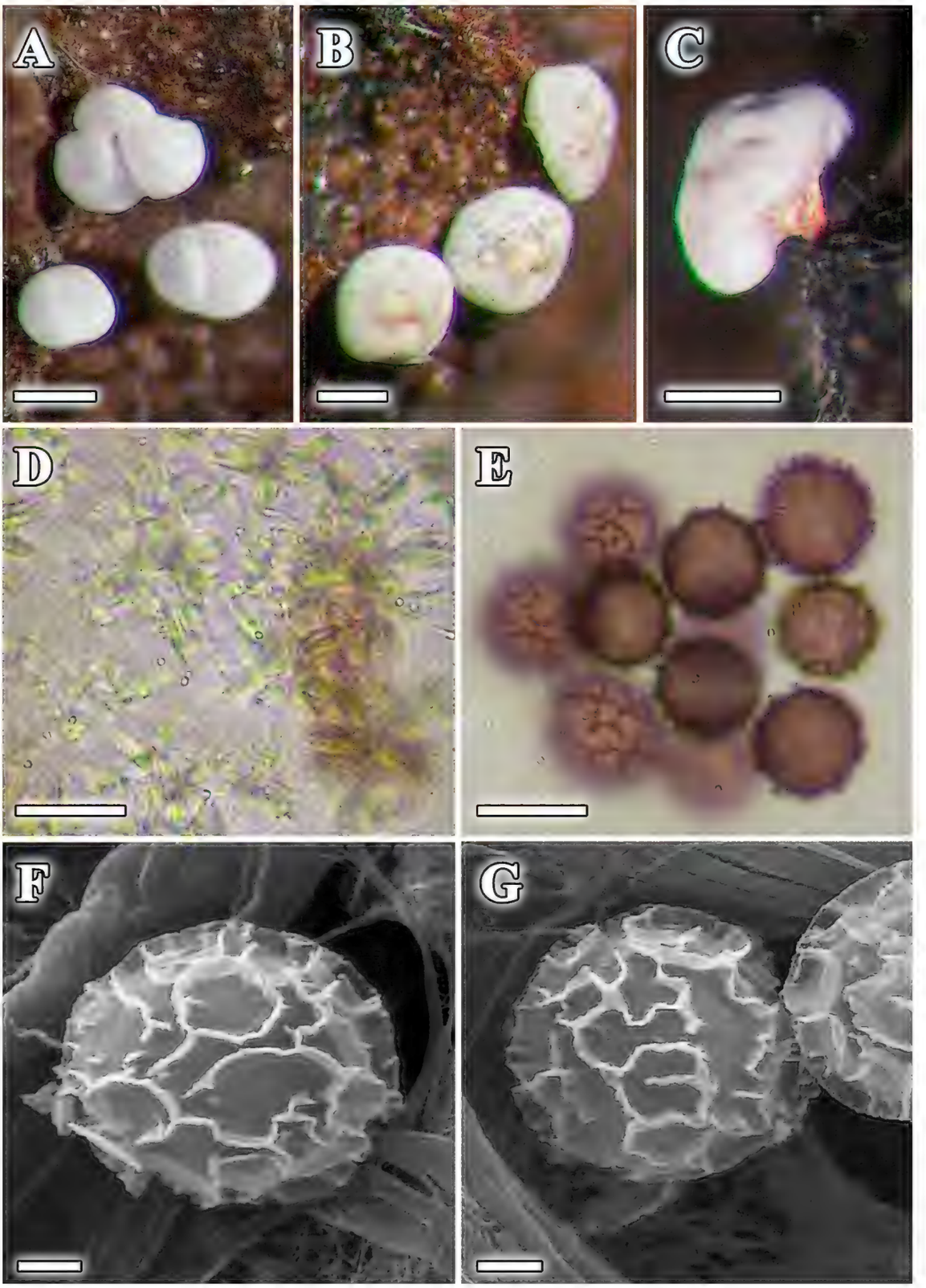

Fig. 1. *Didymium dictyosporum* (holotype, AH 51461): A, B. Fruiting bodies (AH 51462); C. Detail of stipe; D. Peridium crystals (LM); E. Spores (LM); F, G. Spores (SEM). Scale bars: A–C = 0.1 mm; D, E = 10 µm; F, G = 2 µm.

is formed by broad reticules that have 4–7 meshes per hemisphere, with high (≤1 µm) walls lacking perforations and with an irregular to sinuous edge.

Additional specimens examined: **MEXICO. Mexico City**: Parque Tezozomoc, on bark of *Populus deltoides*, placed into moist chamber culture 30–III–2021, obtained 4–VI–2021, leg. M. Lizárraga & H. R. Pelayo (UACJ 3384); obtained 10–VIII–2021 leg. M. Lizárraga & H. R. Pelayo (AH 51462).

Observations—*Didymium dictyosporum* is characterized by its small sessile to short-stipitate fruiting bodies, cartilaginous sporotheca, absence of pseudocolumella and capillitium, and 9–11(–13) µm reticulate spores.

Didymium atrichum Henney & Alexop., is a similar species with spores 10–11 µm diam., "spinulose or faintly reticulate under the light microscope but conspicuously reticulate under the scanning electron microscope" (Henney & al. 1980). The spore reticulum is very different; it has more than 17 meshes per hemisphere and low (≤0.3 µm high walls.

Didymium reticulosporum Novoz. & Zeml., another reticulate spored species, differs mainly by fruiting bodies with a simple membranous peridium, larger (13–16 µm diam.) spores that are reticulate with a basal secondary reticulum that is visible only under SEM and formed by small meshes covering the epispore (Novozhilov & Zemlyanskaya 2006).

Didymium subreticulosporum Oltra & al., also with subreticulate to reticulate spores, is distinguished by a capillitium of calcium carbonate crystals occurring in lines that emerge radially from the central part of the sporocarp. This differs from the typical capillitium formed by hyaline threads found in the genus *Didymium* (Oltra & al. 1997; Lizárraga & al. 1998).

Acknowledgments

We express our gratitude to S.L. Stephenson (University of Arkansas, Fayetteville, U.S.A.) and Á. López-Villalba (University of Greifswald, Greifswald, Germany) for their revisions of the manuscript. We thank Mr. A. Priego and Mr. J. A. Pérez (Electron Microscopy Service, University of Alcalá) for their invaluable help with the SEM. We also thank Luis Monje and Ángel Pueblas (Department of Drawing and Scientific Photography, University of Alcalá) for their help in the digital preparation of the photographs, and we are grateful to Dr. J. Rejos, curator of the AH herbarium, for his assistance with the specimens examined in the present study. We also thank Dr. H. Pelayo for her help with the manuscript translation.

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